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It is with great pleasure that we observe the great reluctance of the author to establish new species; on the contrary she has refrained from giving names where most monographers would certainly have done so. Thus on page 96, after a description which might have been considered adequate, (at least by those who are fond of seeing their names cited in connection with specific names) the author says: "To avoid further confusion in nomenclature I refrain from giving a name to this plant until it is possible to obtain further data." We would commend this sentence to the careful consideration of a certain class of botanists who are apparently more anxious for their own "credit" than for the progress of the science.

Thirty eight plates, many of them half-tone reproductions of photographs, accompany this useful paper. If space permitted we should be glad to quote from the author's introductory discussion, which is full of interesting facts and suggestions; thus a case is cited in which the flower-stalk grew for twenty days at the average rate of two and three-fourths inches per day!—Charles E. Bessey.

ZOOLOGY.

Sense of Sight in Spiders.—A detailed account of the experiments conducted by G. W. and E. G. Peckham for testing (1) the range of vision and (2) the color sense of spiders is published in a late volume of the Trans. Wisconsin Academy. The evidence offered by the authors is based upon a study of twenty species of Attidæ. This study has extended over eight successive summers, during which notes were made of many hundreds of observations. The movements and attitudes of the spiders of the group chosen are wonderfully vivid and expressive. The males, in the mating season, throw themselves into one position when they catch sight of a female, and into quite another at the appearance of another male. This power of expression through different attitudes and movements is of great assistance in determining not only its range of sight, but also its power of distinct vision.

The spiders were confined in boxes, the sides of which were marked off into inches. The bottom was of cotton cloth, the top of glass. Notes were taken of the distances at which prey was noticed, followed and captured. During their mating season the evidence was conclusive that these spiders not only see, but see clearly at considerable distance. The following description of one of the many experiments described in the article serves to show the method of investigation:

A male of *Saitis pulex* was put into a box containing a female of the same species. "The female was standing perfectly motionless, twelve inches away, and three and a half inches higher than the male. He perceived her at once, lifting his head with an elert and excited expression, and went bounding toward her. This he would not have done if he had not recognized her as a spider of his own species. When four and one-half inches from her he began the regular display of this species, which consists of a pecular dance. This he would not have done had he not recognized her sex."

At another time a male of *Hasarius hoyi* was dropped into a box with another male which was standing seven inches away. "He at once threw up his first legs, this being a challenge to battle. The other male responded by throwing up his first legs. The two advanced upon each other slowly, and when only two inches apart began to circle about each other, waving their legs. The same male when put into a box with a female saw her as she stood quite eleven inches away, and at once lifted his first legs, not straight up, as in the case with the other male, but obliquely, and began to move with a gliding gait from side to side, this being the characteristic display before the females in this species."

That the spiders recognize each other by sight and not by any other sense is evidently shown by the fact that they remain unconscious of each other's presence when back to back, no matter how excitable they are when they come within range of each other's vision. As a further evidence of recognition by sight a male of *Dendryphantes elegans* was removed from the box in the midst of his courtship of a female, his eyes gently blinded with paraffine, and then restored to the box. He remained entirely indifferent to the presence of the charmer that had so much excited him a few moments before.

To sum up the result of these experiments:

"The Attidæ see their prey (which consists of small insects) when it is motionless, at the distance of five inches; they see insects in motion at much greater distances; they see each other distinctly up to at least twelve inches. The observations on blinded spiders, and the numerous instances in which spiders were close together, and yet out of sight of each other, showing that they were unconscious of each other's presence, render any other explanation of their action unsatisfactory. Sight guides them, not smell."

As to a color-sense in spiders, the authors are of the opinion that their experiments, while not conclusive, yet all taken together, strongly indicate that spiders have the power of distinguishing colors. (Trans. Wisconsin Acad. Sciences, Vol. X, 1895.)

Classification and Geographical Distribution of the Naiades.—In his study of the fresh water pearly muscles, Mr. Simpson finds that the division of these mollusks into two families, Unionidæ and Mutelidæ, founded on the completeness or incompleteness of the development of the siphons, cannot stand. He accordingly diagnoses the two families on the basis of the shell characters, and finds that his distinctions fully agree with what is known of the facts of geographical distribution of the paleontology of the Naiades, and the classification of v. Ihering, based on the characters of the embryos. The Unionidæ, as defined by the author, include the genera Unio Retzius, Anodonta Lamark, Prisodon Schumacher, Tetraplodon Spix, Castalina v. Ihering, Burtonia Bourguignat, Arconaia Conrad, Cristaria Schumacher, Lepidodesma Simpson, Pseudodon Gould, Leguminaia Conrad and Solenaia Conrad. In the Mutelidæ he places the following genera:—Mutela Scopoli, Chelidonopsis Ansey, Spatha Lea, Pliodon Conrad, Brazzæa Bourguignat, Glabaris Gray, Iheringella Pilsbry, Monocondylæa d'Orbigny, Fossula Lea, Mycetopoda d'Orbigny.

The author considers the relationship between these two great groups as not a very close one. The Unionidæ are characterized by schizodont teeth and a *glochidium* embryo. The Mutelidæ have taxodont teeth, and, so far as is known, the embryo is a *lasidium.*

Mr. Simpson finds that the Naiades are capable of being grouped into assemblages of related forms which have a more or less immediate common ancestry; and on the basis of this grouping they are distributed into eight provinces, as is shown in the following table:

Palearctic,	Europe. Northern and Western Asia. North Pacific to the Desert. Pacific drainage of North America.
Ethiopian,	Africa south of the Sahara.
Oriental,	Asia south of the Himalayas. East Indies to the Solomon Islands.
Australian,	Australia. Tasmania. New Zealand.
Neotropical,	South America.

Central American, . .	Central America. Mexico east of the Cordillera. Cuba.
Mississippian, ...	Entire Missisippi Valley and the Gulf drainage from West Florida to the Rio Grande. Mackenzie River system. Red River of the North. Great Lakes.
Atlantic, ...	Lower St. Lawrence and rivers of eastern Canada. Atlantic drainage of the United States.

The Unios date back in America to the Trias, where they were first discoved by Prof. E. D. Cope. The relations of the existing Naiad fauna with the fossil forms is given by the author as follows:

"The post-Cretaceous Unios of the northwestern States is evidently closely related to the fauna of the Mississippi Valley, and this seems to be related to that of Tropical Africa, as well as to the tertiary forms of eastern Europe and Siberia. The Unios of Australia and South America are apparently closely related to those of the Australian region. There seems to be, too, a general relationship between the Mutelidæ of Africa and South America. These Mutelids and the Unios which bear the embryos in the inner gills have perhaps formerly occupied extensive areas in the northern hemisphere, and may have been supplanted by more modern forms." (Proceeds. U. S. Natl. Mus., Vol. XVIII, 1896.)

Arkansas Fishes.—As the result of less than three weeks' collecting in western Arkansas, eastern Indian Territory and the St. Francis River in northeastern Arkansas, Prof. Meek obtained 83 species of fishes. A new Notropis was found in the Potean River, and a new species of Fundulus is described from the St. Francis. Mollusks are abundant in old river, the old channel of the St. Francis. Six species of Unionidæ were found at a locality farther north than hitherto reported. (Bull. U. S. Fish Commission for 1895, Wash., 1896.)

Batrachia and Reptilia of Madagascar.—The two collections of reptiles from Madagascar, now in the Natural History Museum of Paris, have been examined by M. Mocquard, who reports upon them as follows: The Grandidier collection comprises 68 species in all, Ophidians 13, Bathrachians 20, of which 3 are new species belonging to the genera Mantidactylus, Rhacophorus and Calophrynus. Lacertilians 35, including 2 new species, referred to the genera Lygodactylus and Phyllodactylus. The Allnand and Belly collection comprise 33 Reptiles and 16 Batrachians. Among the latter are 2 new species of Mantidactylus and 1 of Stumpffia. There are but 11 Sphidia, but these include types of two new genera, Compsophis and Alluondina and a new species of Pseudoxyrhopus. The Lacertilia, 22 in number, yield 4 new species referred to the following genera: Chameleon, Brookesia, Uroplates and Paracontias. The diagnosis of the new Reptiles of this collection have been previously given in the *Comptes rendus de la Soc. Philom.* for 1894.

A comparison of these two collections, with the forms described by Prof. Boettger from Madagascar, shows that certain species considered by him as peculiar to Nossi-Bé are found distributed all through the northern part of the island. This is true not only of the Reptiles but of the Batrachians also. (Bull. Soc. Philom., Paris, 1895.)

The Molting of Birds.—In a paper published recently in the Proceeds. Phila. Acad., Mr. Witmer Stone gives a detailed account of his observations on the molting of birds, with especial reference to the plumages of the smaller land birds of eastern North America. Attention is directed to the following points: order, number and times of molt; change of color by abrasion; seasonal plumages; direct change of color in feathers. As a result of his studies Mr. Stone makes the following generalizations:

I. The annual moult at the close of the breeding season is a physiological necessity, and is common to all birds.

II. The spring molt and striking changes of plumage effected by abrasion are not physiological necessities, and their extent is dependent upon the height of development of coloration in the adult plumage, and does not necessarily have any relation to the systematic relationships of the species.

It naturally follows that closely related species may differ materially in the number and extent of their molts, and that males and females of the same species differ greatly in this respect when the nuptual plumage of the adult male is highly developed as compared with that of the female or with its own winter plumage.

III. The amount of change effected in the plumage at any particular molt varies considerably in different individuals of the same species and sex.

IV. Some species which have a well marked spring molt in their first and second years may discontinue it afterwards, when the adult plumage has once been acquired. And, on the other hand, some individuals may continue to molt in the spring, while others of the same species cease to do so.

V. The remiges are molted less frequently than any other part of the plumage. As a rule, they are only renewed at the annual molt (exception Dolichonyx).

VI. Variability in the order of molt in the remiges and presence or absence of molt in the flight feathers at the end of the first summer are generally family characters, i. e., Cerylе differs from any other species treated of in this paper in the order of molt in the primaries. All Picidæ and all Icteridæ, except Icterus (and Dolichonyx ?), molt the flight feathers with the rest of the first plumage. None of the Oscines except Icteridæ (as above), some (all ?) Hirundinidæ, Olocoris and Cardinalis molt the flight feathers at this time.

Mr. Stone's conclusions as to "color-change without moulting" are the same as those reached by Chapman, in his article on "The Changes of Plumage in the Dunlin and Sanderling," namely: that color-change without molt or abrasion is incapable of taking place from the very nature of the structure of a feather, and that all the cases so reported can be otherwise acconnted for. (Proceeds. Acad. Nat. Sciences, Phila., 1896.)

The Florida Deer.—The fact that the Florida deer is but little more than half the size of the deer of northeastern United States, together with certain cranial and dental peculiarities, is sufficient, according to Mr. Outram Bangs, to give it full specific rank. He therefore describes it under the name *Cariacus osceola.* The most striking differences between the Florida animal and its northern relatives are (1) the shape and size of the nasal and maxillary bones, and (2) the very large molar and premolar teeth. (Proceeds. Biol. Soc. Washington, Vol. X, 1896.)

ENTOMOLOGY.[1]

Professor Forbes' Eighth Report.—The nineteenth report from the office of the State Entomologist of Illinois, covering the years 1893–4, has recently been issued. It is the eight report of the present incumbent, Professor S. A. Forbes, and adheres closely to the lines of thorough and accurate record, which have made its seven predecessors notable in the literature of economic entomology. The bulk

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[1] Edited by Clarence M. Weed, New Hampshire College, Durham, N. H.